



Oide

Tacú leis an bhFoghlaim
Ghairmiúil i measc Ceannairí
Scoile agus Múinteoirí

Supporting the Professional
Learning of School Leaders
and Teachers

Senior Cycle Biology

Professional Learning Booklet

Day 3 - 2025 / 2026



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Supports for Participants

Senior Cycle Biology Specification	Guidelines to Support the Biology in Practice Investigation	SEC Sample Papers	LabXchange Simulation Library
			



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Supporting the Professional
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Engaging with the Guidelines for the Biology in Practice Investigation Speed Learning Carousel

Stage	How would you engage your students?
Initial Response	
Background Research	
Designing and planning the Experiment	
Conducting the experiment	
Data Analysis and Conclusions	
Finalising the Report	

Learning Reflection - Station 1 - Genome Databases

3.3.5 Learning Outcome: Use a genome database to search for alleles that are known to cause (or be responsible for) specific genetic diseases



Scan the QR code to access the activity



Task 1	Genetic	Not Genetic
Task 2 Search	Name of gene: Role of the gene: Chromosome Number:	Name of gene: Role of the gene: Chromosome Number:
Task 3 Genetic Crosses	1. Write down the genotype and phenotype for both Lisa and Alex - using appropriate symbols	
	2. Model the possible genotypes and phenotypes of the children for Cystic Fibrosis using a Punnett square, or another suitable method.	
	3. Model the possible genotypes and phenotypes of the children for Huntington's Disease using a Punnett square, or another suitable method.	

Learning Reflection - Station 1 - Genially

3.3.5 Learning Outcome: Use a genome database to search for alleles that are known to cause (or be responsible for) specific genetic diseases



Task 3 Continued	4. What is the probability of their child being a carrier of Cystic Fibrosis (Ff)?	
	5. What is the probability of their child inheriting Huntington's Disease (Hh)?	

Task 4 - Talking Heads Strategy

Instruction:

There are 6 statements

Use one of the statements to guide group discussions.

In rotation, share opinions, backing them up with reasoning.

Each person must listen carefully as others share their points.



1. The first person will agree or disagree with the statement and express the reasons for their choice.
2. The next person must then:
 - a. **agree** and add to it. Another example that supports this opinion is . . .
 - b. **disagree**/challenge it ("I understand, but have you considered . . .")
 - c. or **change** their opinion ("Originally, I thought this.. However, I have changed my thinking because . . .")
3. Continue around the station to allow everyone share their opinion, before choosing another statement.

Reflection:

What other contextual strand learning outcomes can engagement with this activity support?

What unifying strand learning outcomes can students engage with during this activity?

How does changing the surface area of the food affect the rate of enzyme activity?

Modify

Adapt

Adjust how the volume of foam is measured, e.g. how long it takes to produce a certain volume

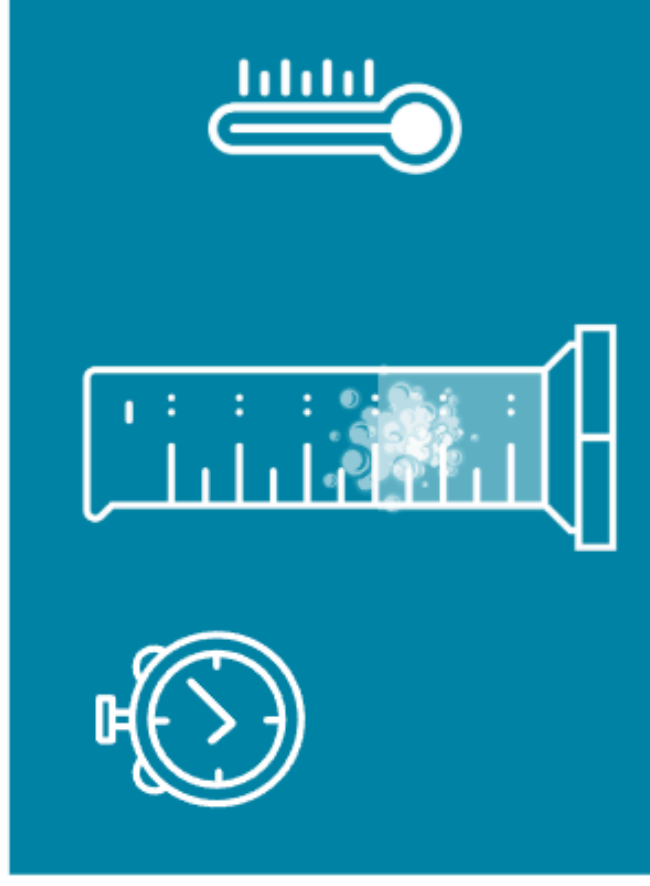
Combine

Could I combine different temperature and pH levels and study their interaction?

Substitute

What happens if I change the concentration of hydrogen peroxide? Or use a different source of catalase e.g. potato

SCAMPER



Purpose

How might this investigation be related to real world examples, e.g. pH and temperature in food preservation?

Eliminate

Remove the dishwashing soap and measure oxygen production using a gas collection kit.

Rearrange

Change the order in which the reagents are added - does this affect the reaction?

Substitute (Swap)

- Could I swap for a different chemical, object, method, variable, material or piece of apparatus
- Could I replace any parts or features in the original to improve or change the design to make it my own?

Combine (Bring together)

- Could I combine methods or pieces of apparatus to test my hypothesis?
- If I repeat the test many times and combined the results to get an average, would it improve my investigation?

Adapt (Change)

- Could I adapt a piece of apparatus to serve my need?
- Could I adapt a method to work for my experiment?
- Could a solution to one issue be adapted to help solve a different issue?

Modify (Magnify/Minify)

- Could I modify the time taken for my experiment? Could I modify an experimental set up to make it safer?
- What could I make bigger or smaller to improve the efficiency of my design?

Purpose (Possible other use)

- Could the products or by-products of my experiment be put to use in the real world?
- Could my apparatus, method or device be used for something else? Could I use my apparatus in other investigations?

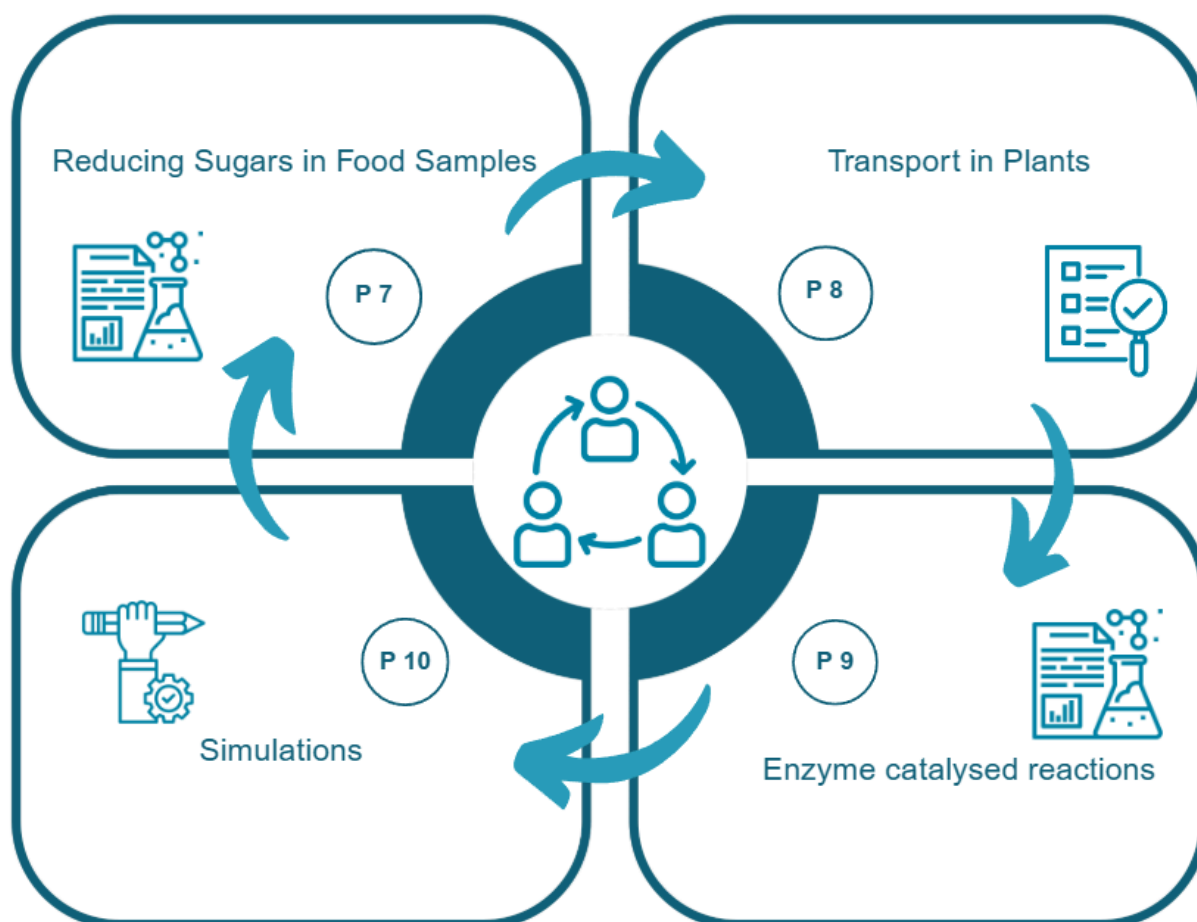
Eliminate (Remove)

- Could I remove a variable affecting my results?
- Could I eliminate a piece of apparatus?
- What can be removed or simplified?

Rearrange (Reverse)

- Would rearranging the order of steps in my method produce a different outcome?
- What if I reversed the way my device works
- What other arrangement might work better or more efficiently?

Active Learning Stations in the Biology Classroom



Notes

Learning Reflection- Reducing Sugar Station

1.2.6 Learning Outcome: Investigate quantitatively the level of reducing sugars in a range of food samples, use primary data to support conclusions



What other contextual strand learning outcomes can engagement with this activity support?	A	B
What unifying strand learning outcomes can students engage with during this activity?		
Substitute (Swap)		
Combine (Bring together)		
Adapt (Change)		
Modify (Magnify/minify)		
Purpose (Put to another use)		
Eliminate (Remove)		
Rearrange (Reverse)		

Learning Reflection - Transport Station

2.6.16 Learning Outcome: Investigate the factors that affect the rate of transpiration



What other contextual strand learning outcomes can engagement with this activity support?	A	B
What unifying strand learning outcomes can students engage with during this activity?		
Substitute (Swap)		
Combine (Bring together)		
Adapt (Change)		
Modify (Magnify/minify)		
Purpose (Put to another use)		
Eliminate (Remove)		
Rearrange (Reverse)		

Learning Reflection- Enzyme Station

2.1.3 Learning Outcome: Investigate factors affecting the rate of enzyme catalysed reactions, use primary and secondary data to support conclusions



What other contextual strand learning outcomes can engagement with this activity support?	(A)	(B)
What unifying strand learning outcomes can students engage with during this activity?		
Substitute (Swap)		
Combine (Bring together)		
Adapt (Change)		
Modify (Magnify/minify)		
Purpose (Put to another use)		
Eliminate (Remove)		
Rearrange (Reverse)		

Learning Reflection - Simulation Station

Learning Outcome: Investigate patterns using a DNA profile, use primary or secondary data to support conclusions

Learning Outcome: Discuss the ethical issues arising from advancements in genetic technologies



From your analysis of the DNA patterns, can you identify whether or not the DNA sample obtained was of human or animal source. Refer to the data to support your conclusions

Ethics Discussion: In your group, investigate and discuss the question below.



"Genetically modified crops could end world hunger—but should we risk unknown effects on the environment and human health?"

What other contextual strand learning outcomes can engagement with this activity support?	
What unifying strand learning outcomes can students engage with during this activity?	
How could I adapt this activity to cater for the needs of my students (UDL and inclusion)?	

Active Learning Stations in the Biology Classroom

Data Collection - Station 1

[illegible]

Data Collection - Station 2

Date	Time

Active Learning Stations in the Biology Classroom

Data Collection - Station 3

[illegible]

Data Collection - Station 4

Date	Time

A - Planning for the Biology in Practice Investigation in the Leaving Certificate Biology Classroom

Where are there opportunities in your subject plan to develop scientific practices in line with the stages of the Biology in Practice Investigation?



B - Features of an Effective Investigative Log



C - Role of the Teacher Supporting Students' Work during the Biology in Practice Investigation



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Engaging with the Sample Brief

Sample Brief:

Area of Focus:

Context:

Learning Outcomes/Topics

